

Abstract

A video signal is encoded in a progressive video coder so as to generate a progressive coded video bit stream for transmission over a heterogeneous network. The progressive coded video bit stream is configured so as to be decodable at any one of a series of increasing bit rates up to a maximum bit rate, depending on which of a number of corresponding portions of the progressive coded video bit stream are received by a decoder. Each of the portions is associated with a different bit rate, and one or more of the portions may each also be associated with different values of other parameters such as frame rate, spatial resolution, and peak signal-to-noise ratio. Each of the series of increasing bit rates produces progressively better reconstructed video quality at an output of the decoder. The progressive coded bit stream is transmitted over a first part of the heterogeneous network at a first one of the bit rates. One or more selected portions of the progressive coded video bit stream are then transmitted from the first part of the heterogeneous network to a second part of the heterogeneous network. The selected portions are associated with a second one of the bit rates lower than the first bit rate, and may be selected based on an error detected in the transmission over the first part of the heterogeneous network, and/or a characteristic of the second part of the heterogeneous network. The invention provides efficient bit rate scalability and adaptability and is particularly well-suited for use in conjunction with transmission over heterogeneous wired-to-wireless networks.